Explain your answers with neat sketches when applicable. Assume all computations are made on Helmert1906 (a = 6378.2 km, $f = \frac{1}{298.3}$). Also, the mean radius of the earth is R = 6371 km.

Assignment (6) – Mathematical Conical Projection

1. List out any two properties of conical projections.
2. How is Bonne's projection different from the simple conical projections?
3. What are the limitations of conical projections?
4. Which of the following statements is true and which is false?
   a. Conical projections are well-suited for mapping mid-latitude regions.
   b. Conical projections are advantageous for regions with significant east-west extent.
   c. In conical projection, all parallels are arcs of nonconcentric circles and are equi-spaced.
   d. The scale is distorted along the standard parallel and all meridians.
5. If Egypt was projected by simple conical projection find the coordinates of two points M(24^{o}N,24^{o}E), N(29^{o}N,29^{o}E) then find the distortion in the length of western and southern borders of Egypt.
6. The area of the Nile Valley between 22° N, 32° N, and 30° E, 32° E is to be projected using Simple conical projection. It is required to find the coordinates of the two points M (30° N, 31° 30' E) and N (26° N, 30° 40' E).
7. Egypt lies between 22° N, 32° N and 25° E, 37° E, if it's projected by mathematical equivalent conical projection. Find the coordinates and the area limited by the four points F R S T in the map, also find the distortion in this area due to projection, where: F (25° N, 29° E), R (25° N, 35° E), S (28° N, 3S° E), and T (28° N ,29° E).